open mtc

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Standardisierte M2M-Plattformen als Schnittstelle zum Nervensystem der Smart City

Fachkonferenz: M2M und das Internet der Dinge - vom Hype zur praktischen Nutzung
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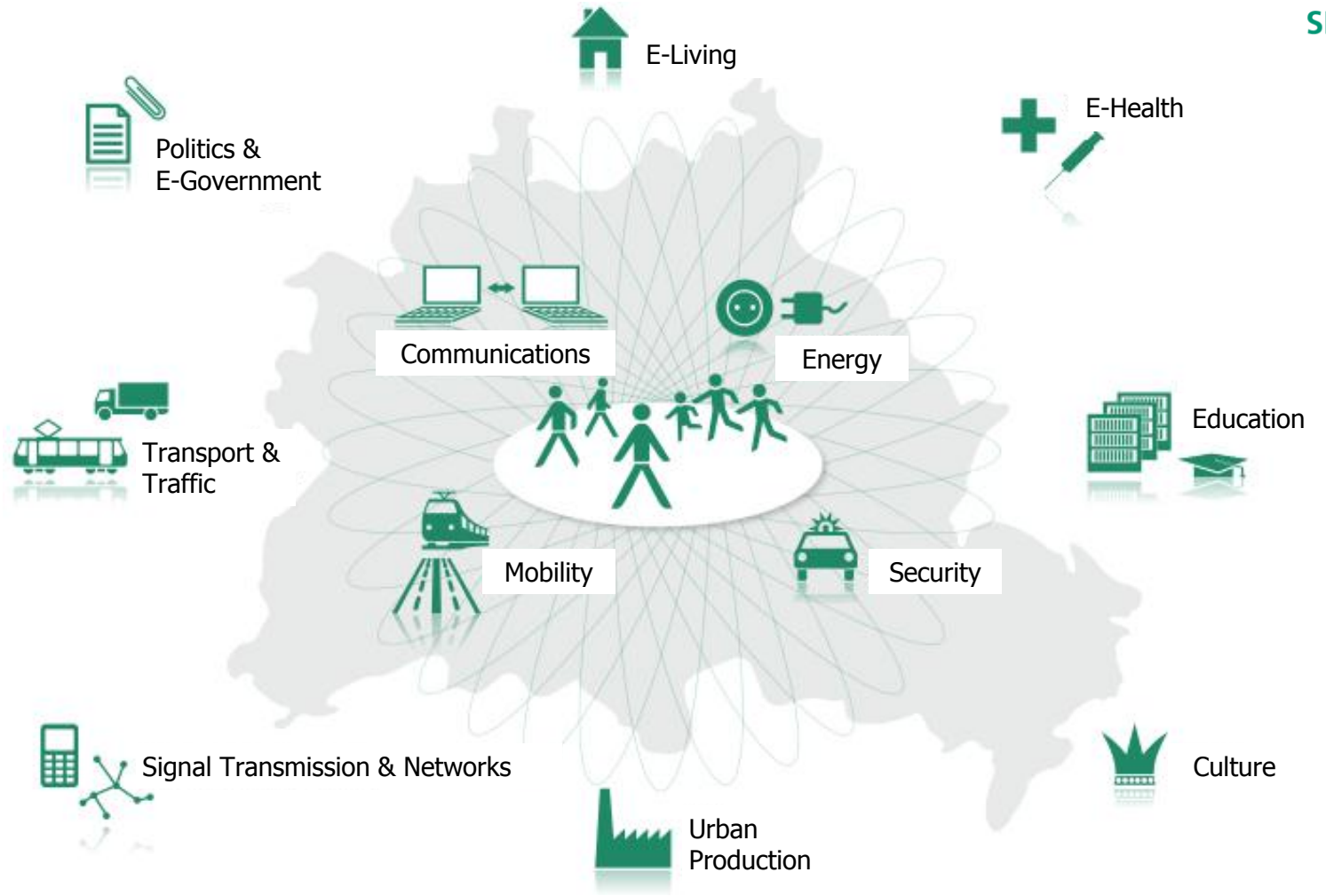
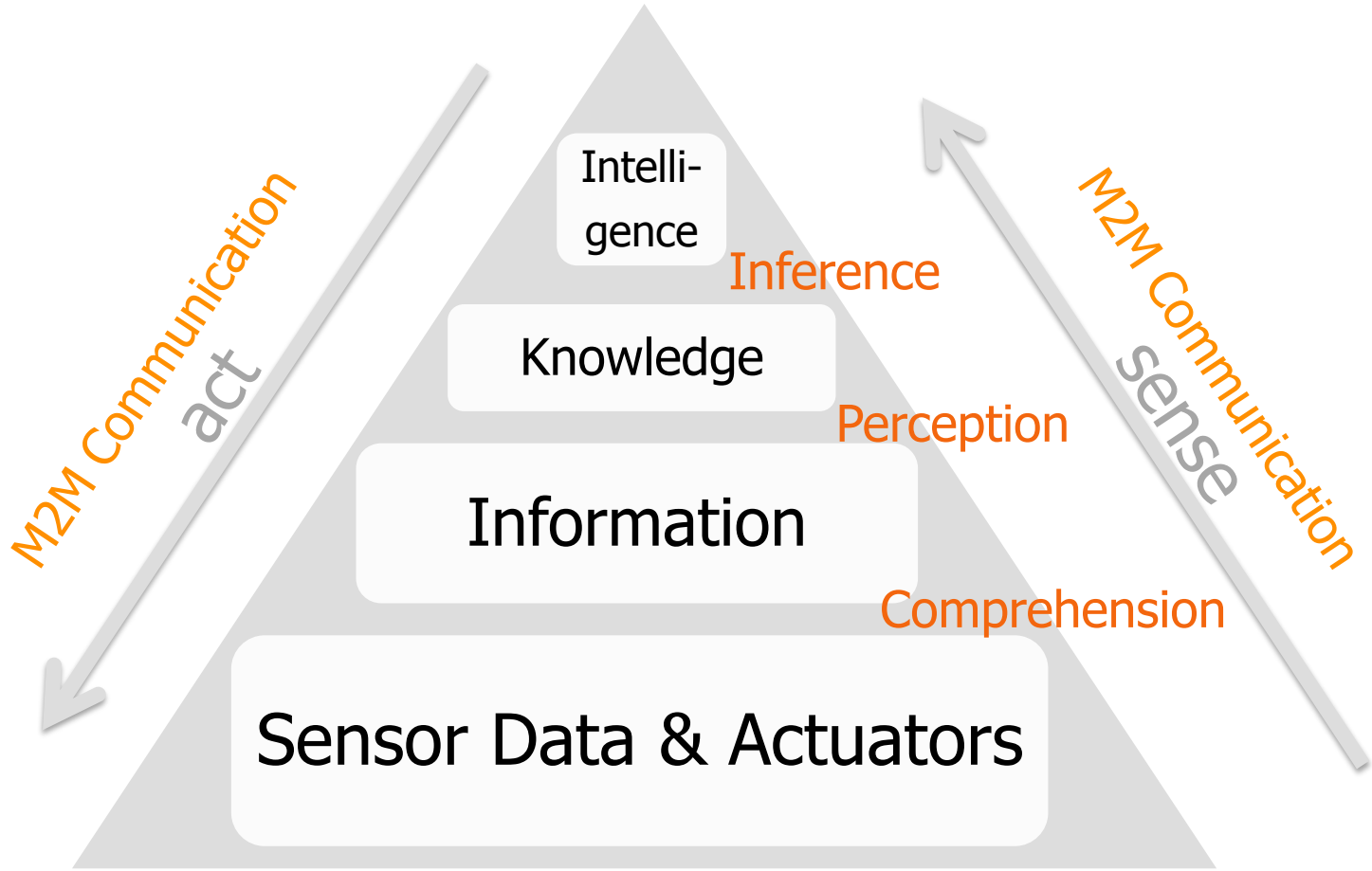
- Sub-companies and representative offices all over the world

Fraunhofer FOKUS is the telecommunications institute within Fraunhofer

Fraunhofer SMART CITIES



To Become Smart Means to Make Sense out of the Raw Data

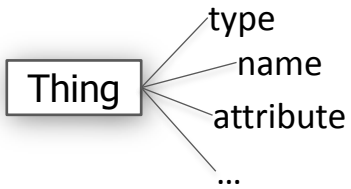


M2M vs. IoT

IoT

Internet of Things – High level information

- Things are modelled to have attributes, e.g. room has an attribute “temperature"
- Discovery of information based on specific criteria: e.g. give me the “average temperature of all rooms in the 2nd floor”



M2M

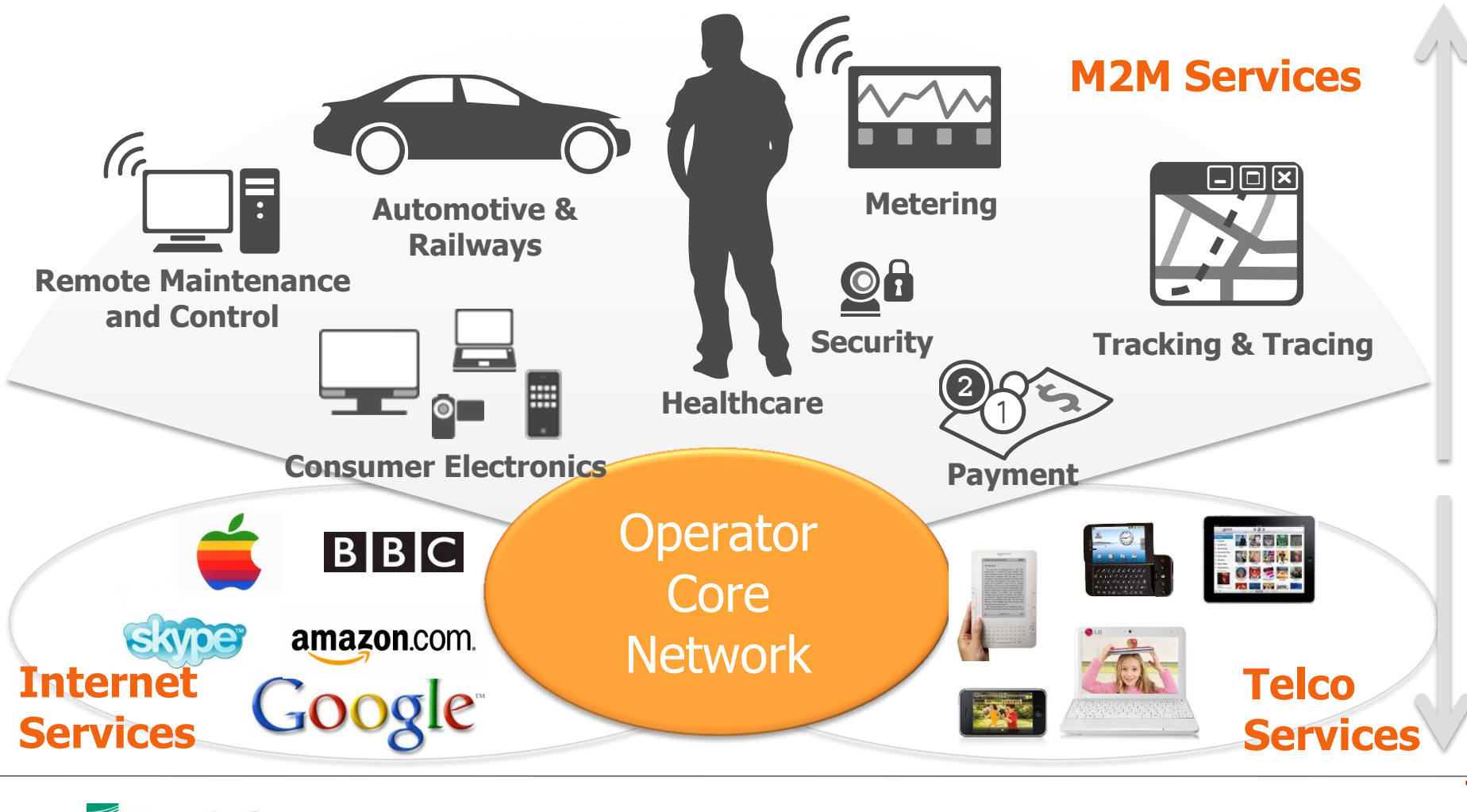
Machine-2-Machine – Low level information

- Sensor and actor devices, e.g. temperature sensor
- Discovery of information based on specific sensor readings: e.g. get the temperature value of sensor 60:FA:CD:6D:D0:4B

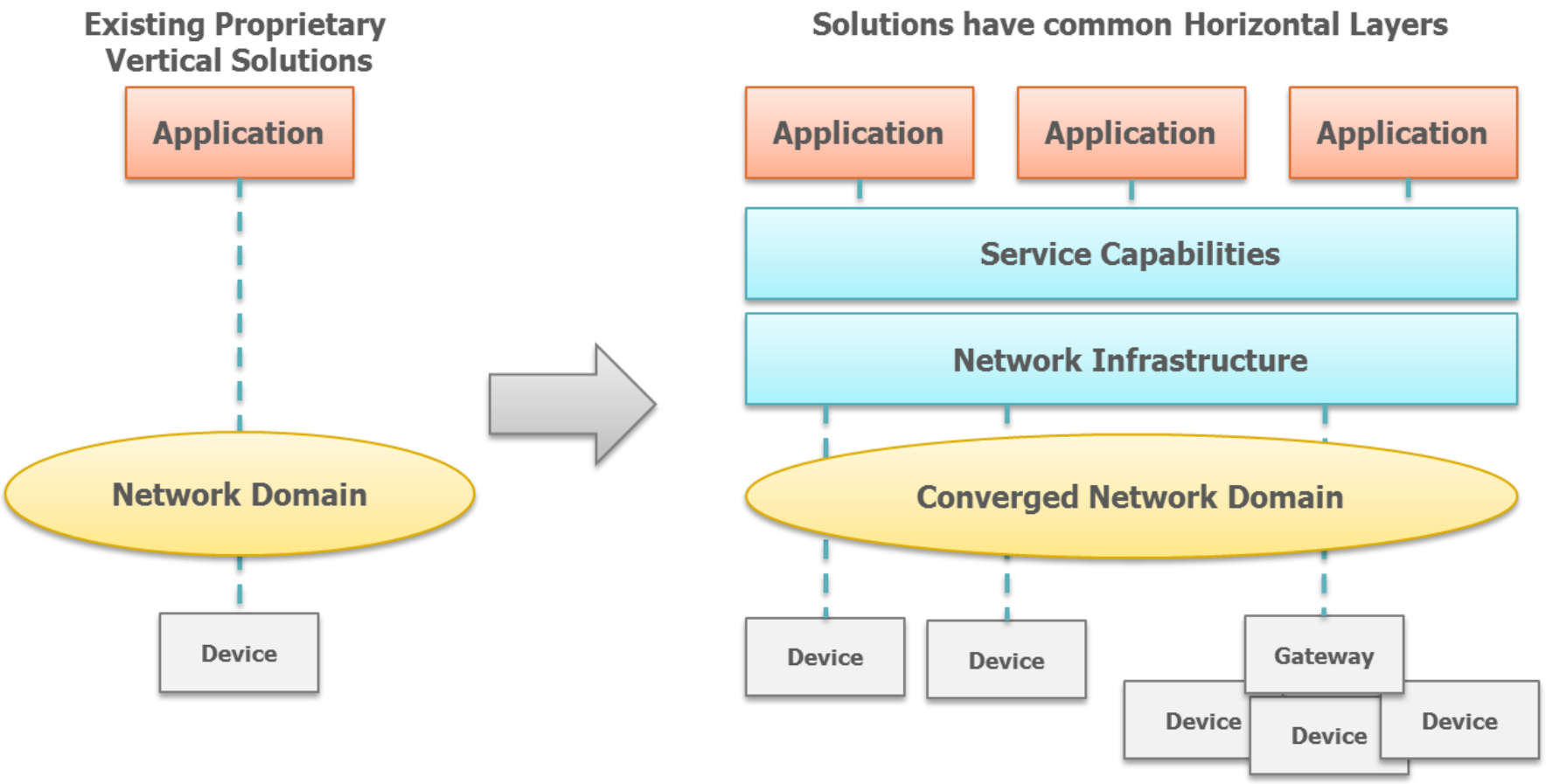
Generally, IoT is part of a larger vision including legislation, security & privacy, governance, business models, etc.

M2M – Total Convergence of Communication

The telecommunication industry and other business branches are currently merging into a total convergence mediation layer possibly around the operator core networks.

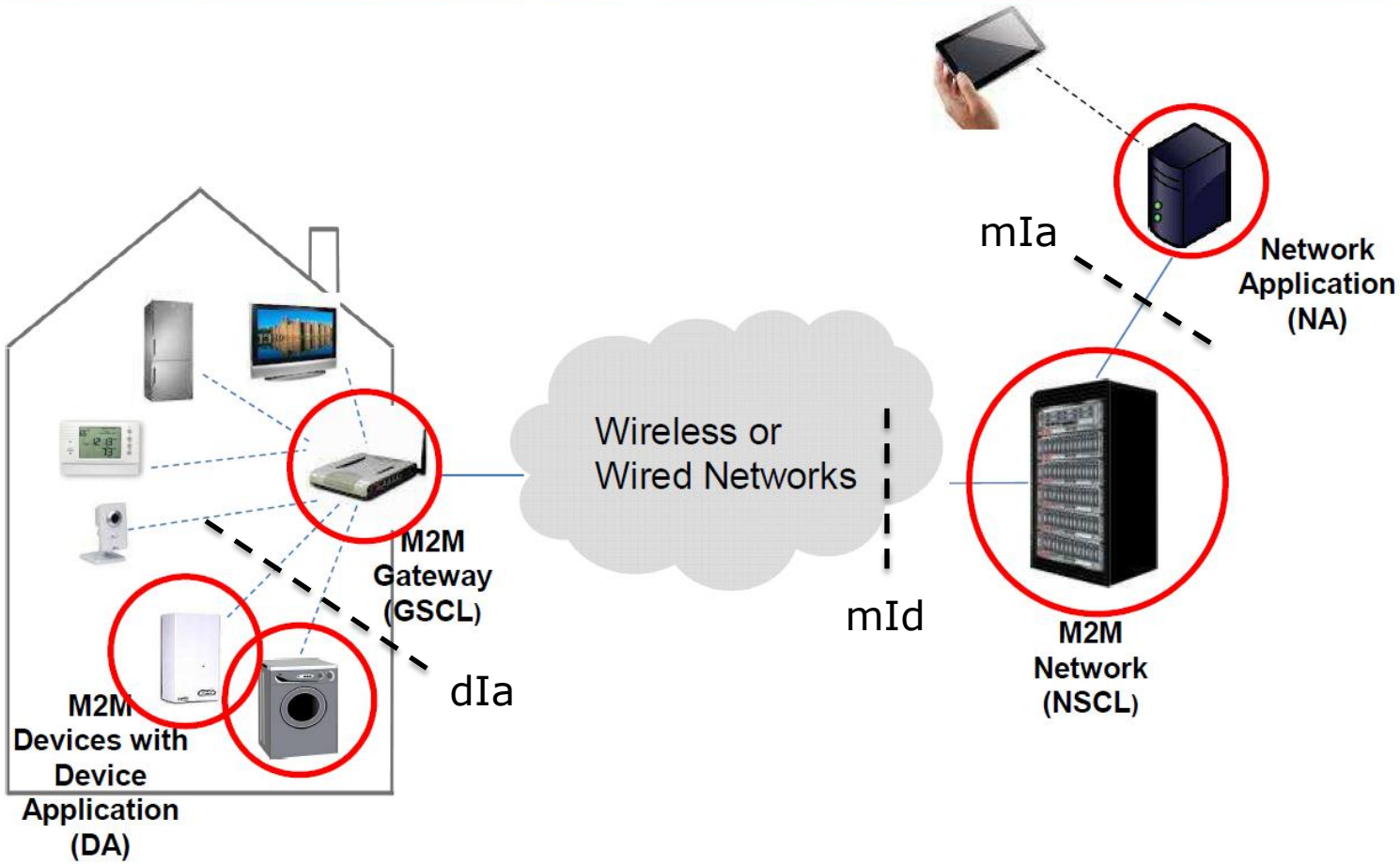


Stop the Silo Mindset - Horizontal Approach for M2M



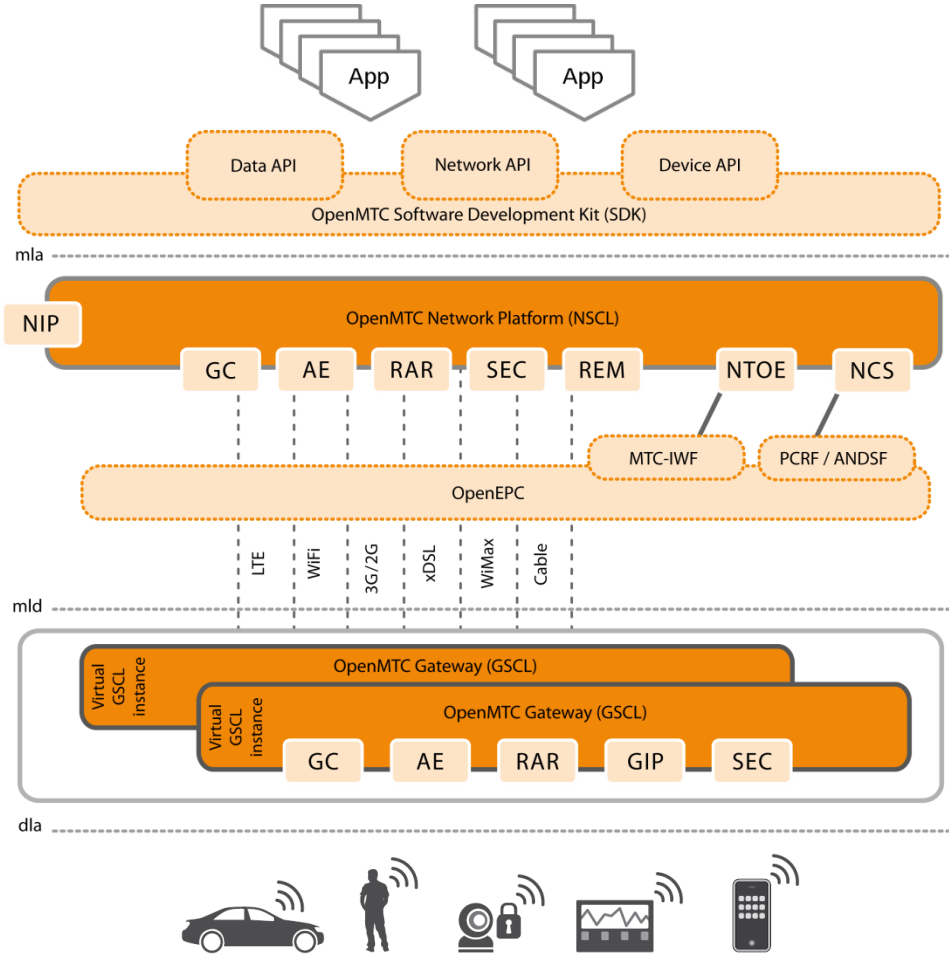
In line with ETSI TC M2M specifications

Example:
Connected home



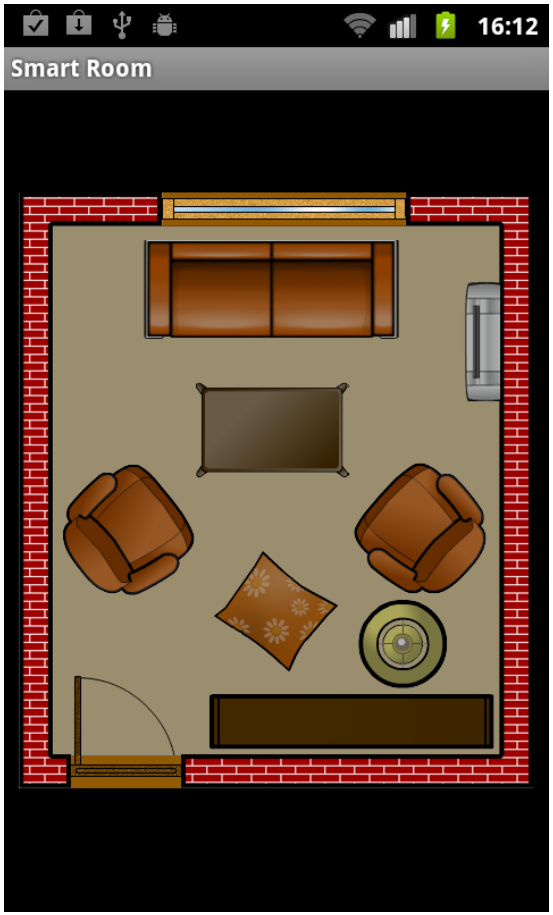
OpenMTC Features

- OpenMTC implements most of the features of ETSI TS 102.921 and 102.690 including a
  - Network Service Capability Layer (NSCL)
  - Gateway Service Capability Layer (GSCL)
- Both layers implement service capabilities:
  - Communication (LTE, 3G, WiFi, fixed)
  - Application Enablement (network, device and gateway applications)
  - Data storage (devices, applications, sensor measurements)
  - Security & Device Management
- OpenMTC allows interworking with
  - OpenEPC (integration with the core network, QoS, access network selection)
  - OpenIMS (IP Multimedia Subsystem)
  - Various sensors and actuators (e.g. FS20 devices, HTML5)



Impressions

- OpenMTC Smart Home Android App
- Builds upon the platform
- Allows to control home devices such as light and air conditioning
- Took a student 3 weeks to develop



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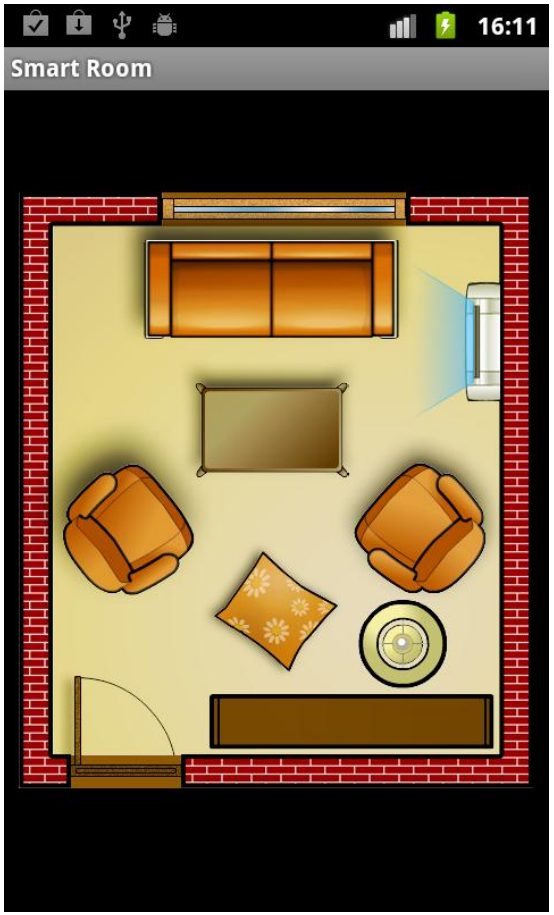

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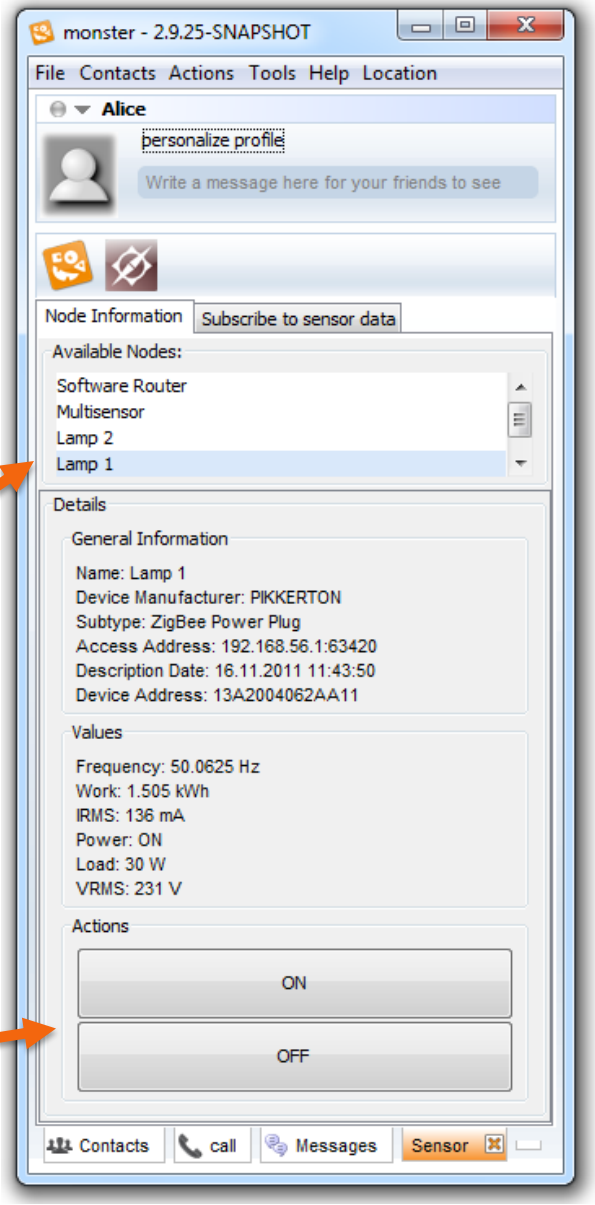
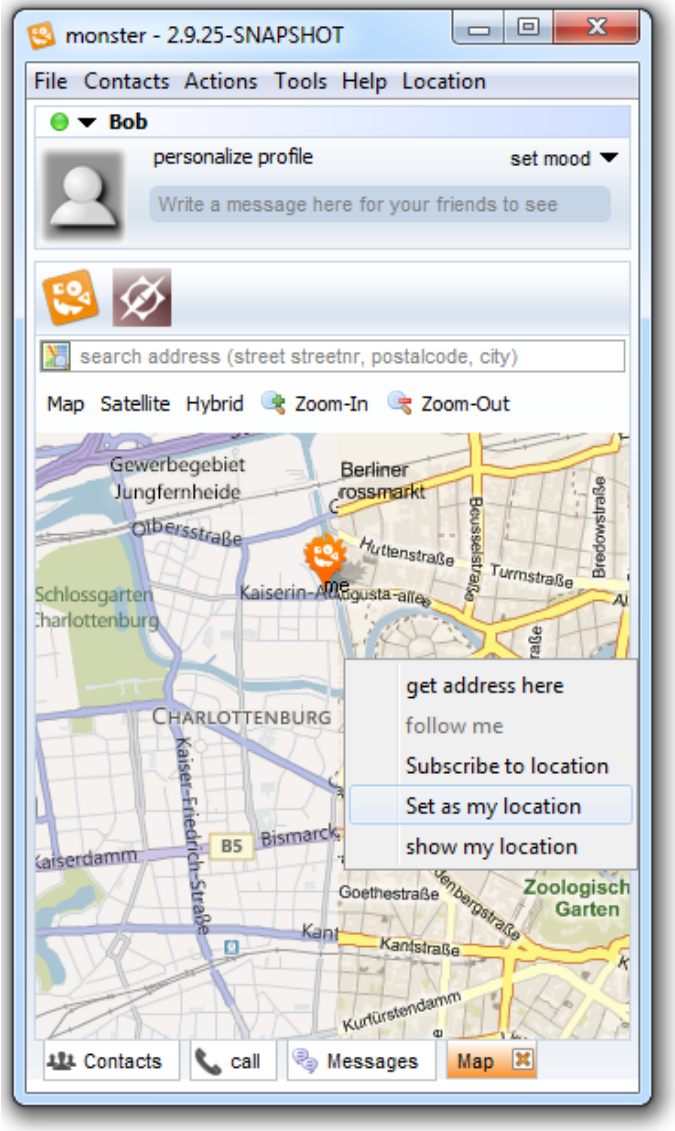
Impressions

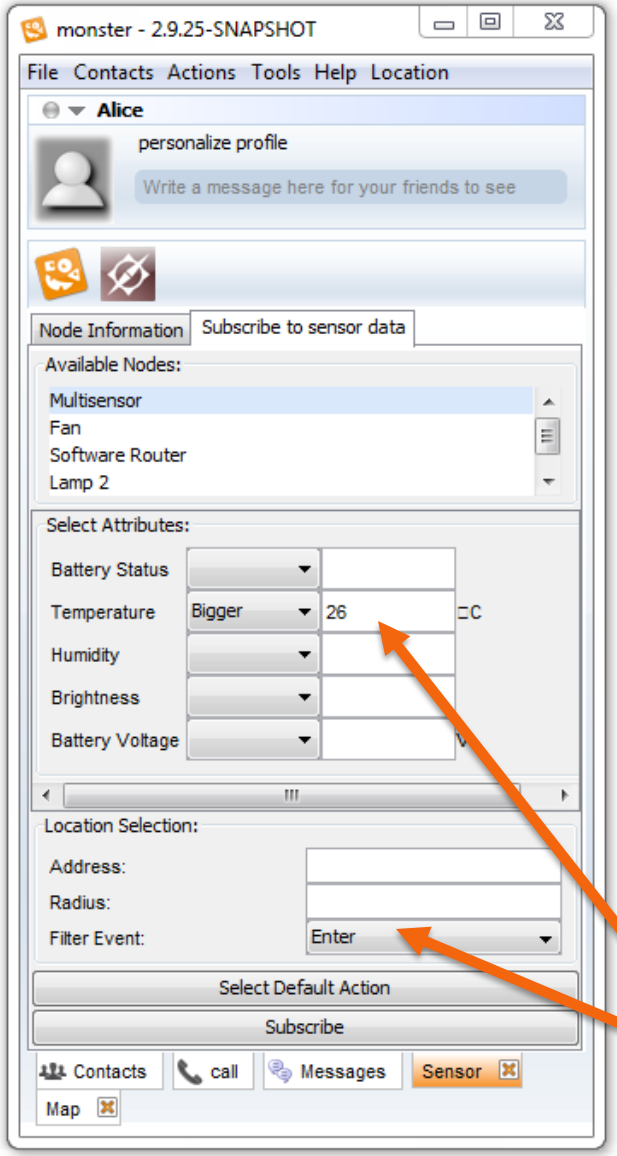
- M2M and IMS integration
- Use communication clients to include machine communication
- Bridge M2M & H2H

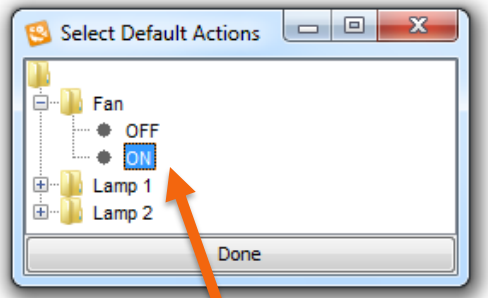
Browse available M2M devices & provided data

Easily perform actions on the devices









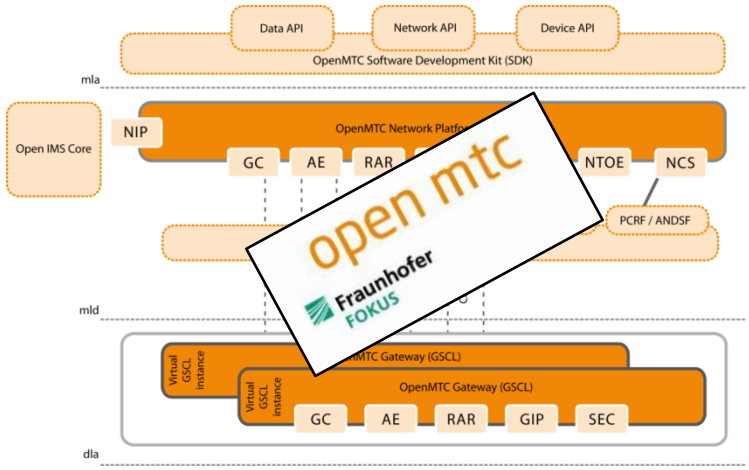
policy action definition

policy condition definition

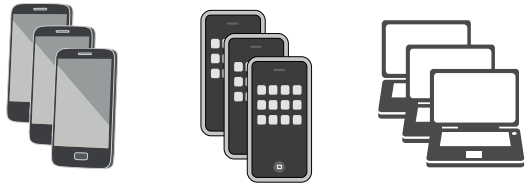
M2M Demo: WiFi Device Tracking

- Detect mobile devices at different locations using WiFi and Bluetooth
- Enable easy tracking of devices
- Gather statistics regarding device type, manufacturer, number of devices, etc.
- Supported by a standard-based M2M platform
- Usage scenarios:
  - Smart City Traffic
  - Location rating
  - Proximity marketing

Tracking applications and metrics



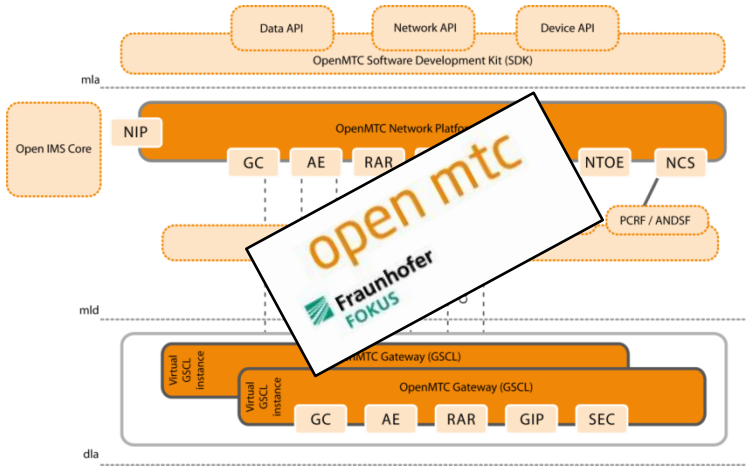
Detect mobile devices



M2M Demo: Cloud Elasticity & Smart Metering

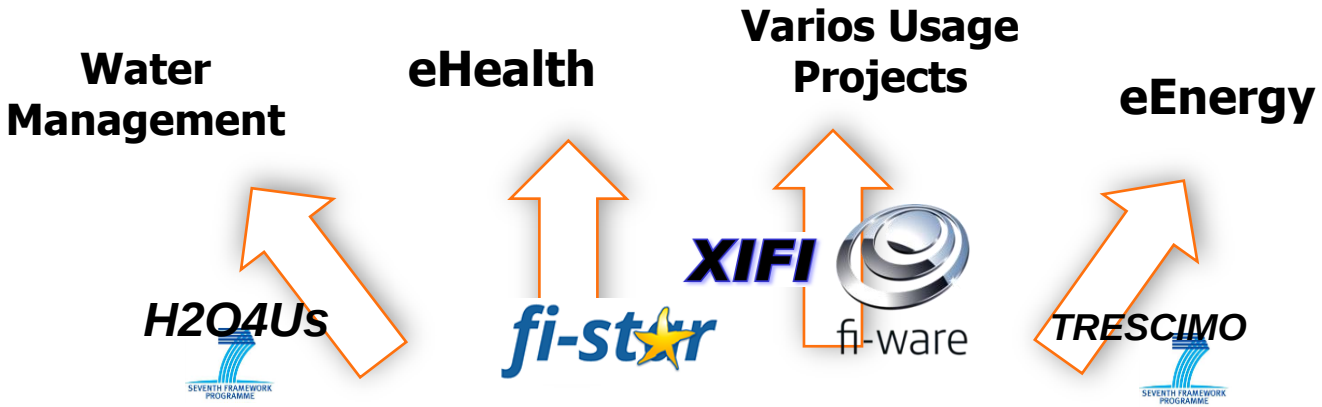
- Federated cloud deployment
- Automatic elasticity scaling application servers and database
- Different stakeholder views on utility metering data
- Third party access based on access rights and policies
- Usage scenarios:
  - Utility metering
  - Value added services
  - Home Automation

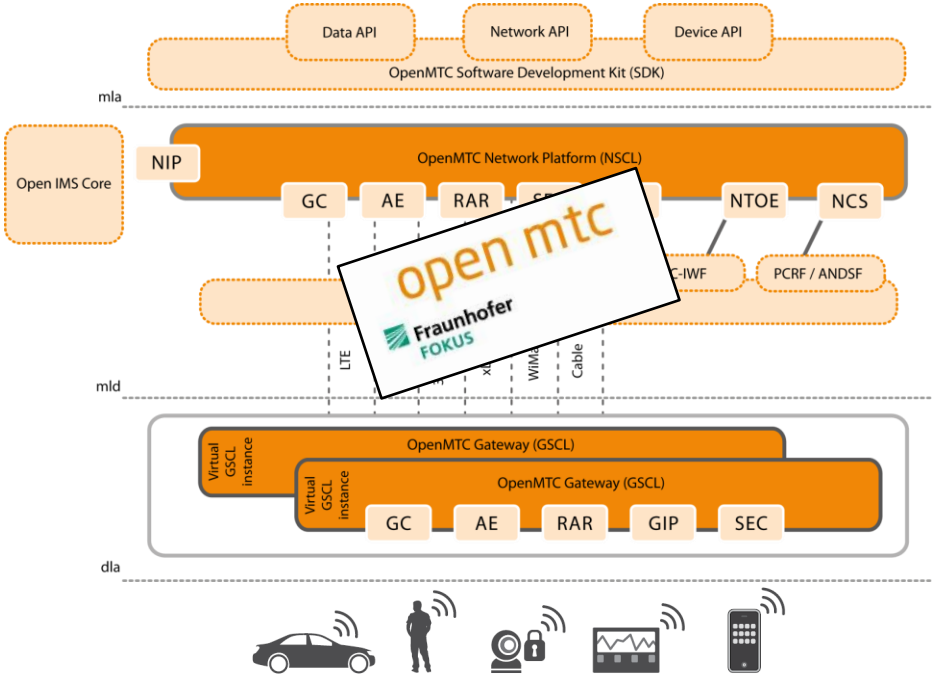
Stakeholder views & Home Automation



Metering data

Current and Upcoming Projects





Summary, Challenges & Input for Discussion

- Horizontal platform standardization and deployment will be needed to overcome M2M silos
- Interfaces for rapid prototyping and application development needed
- Convergence of M2M and H2H communication and data
- Application ideas exist, a lot of technology exists, but we lack solid business models for cross domain data usage in Smart Cities
- What about a public good approach?
  - IoT infrastructure and data to be seen and financed as public good
  - Open access and interfaces to sensors and data: e.g. traffic data, environmental data
- On the other hand: How intrusive do we want our cities to be?
- Philosophical question: How much IoT does humankind actually require?
- Challenges and road blockers for solid business models today : complex ecosystems, many different market players, legal uncertainty, security & privacy issues

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